TADIRAN 社製電池/取扱説明書

この度は、リチウム電池.COM をご用命いただき誠に有難うございます。
電池をご購入いただく際は、必ず“使用上の注意”及び、“MSDS(MATERIAL SAFETY DATA SHEET)”を精読いただき、使用方法を守ってください。
なお、取り扱い説明書及びMSDSを逸脱するような使い方をし、不具合・事故等が発生した場合には弊社は一切の責任を負いませんので、予めご了承願います。

1. 使用上の注意

1.1. 取り扱い上の注意

タディラン・バッテリー社の塩化チオニールリチウム電池は、安全にご使用いただける様に設計されておりますが、さらに安全にご使用して頂くために、次の基本的な注意事項を必ずお守りください。

●外部短絡をしないでください。
●充電はしないでください。
●火には入れないでください。
●許容温度を超えての使用はやめてください。
●潰したり、穴を開けたりしないでください。
●極性を間違って接続しないでください。
●正極を下向きにして、使用しないでください。

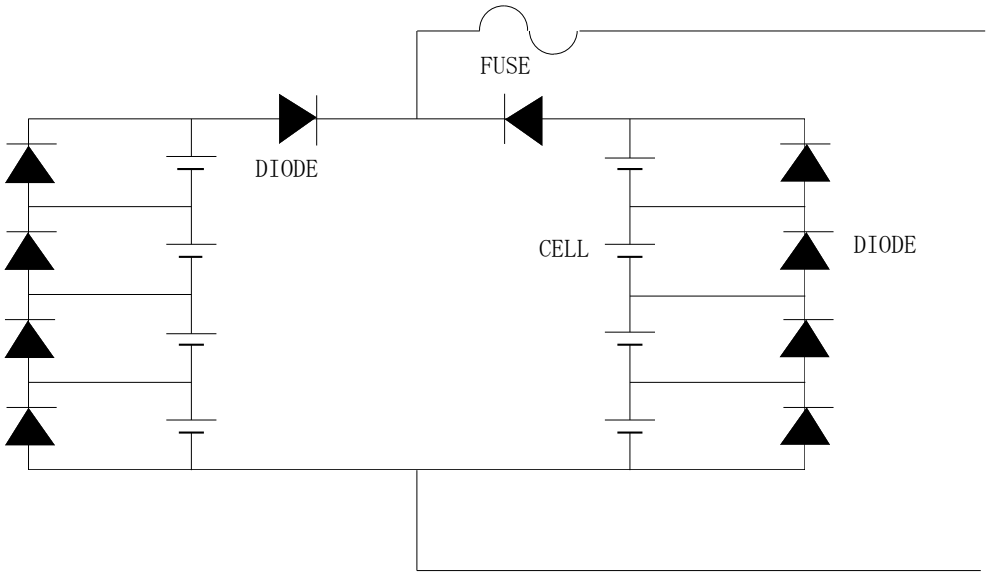
1.2. 保存についての注意

下記に記される様な環境にて、保存してください。

●本製品は 85℃までの環境にて保存可能ですが、自己放電率の観点より
30℃以下での保存を推奨しております。
●保存室での火気の取り扱いはやめてください。
●伝導性のある袋での保存は避けてください。
●保存しているセルに金属面が触れない様にしてください。
●新しいセルと古いセルを一緒に保存しないでください。

1.3. 組み電池についての注意

●異なるタイプのセルや異なるサイズのセルを混ぜて使用しないでください。
●古いセルと新しいセルを混ぜて使用しないでください。
●異なるメーカーのセルを混ぜて使用しないでください。
●半田付けをする際は、1-4 半田付けの注意を読み、従ってください。
●組み電池にする際には、別紙の様な保護ダイオードをつけてください。



1.4. 半田付けについての注意

○手半田

●セルに直接半田付けするのはやめてください。

●半田付けの時間は 10 秒以下で行ってください。

○ウェイブソルダリング

●全てのウェハータイプは、ウェイブソルダリング可能です。

●ボビンタイプセルの 1/2AA, 2/3AA, AA サイズは、ウェイブソルダリングが可能ですが、C, D, DD サイズは手半田にて半田付けをしてください。また、セルが半田槽に落ちますと、破裂の恐れがありますので、取り扱いには特に注意してください。

●予備加熱と乾燥は出来るだけ短時間にて行ってください。半田付けの際、10 秒以上 280℃の加熱はしないでください。また、その際の温度、時間については下表に示します。

	温 度	時 間
予 備 加 熱	140℃以下	80 秒以下
半 田	280℃以下	10 秒以下
クリーニング	85℃以下	―
乾 燥	100℃以下	120 秒以下

●セルをウェイブソルダリングに通す際には、半田域にカバーをつけてください。

●セルを基板に取り付けた際には静電気除去マット上にその基板を置かないでください。電池の容量が流出する恐れがあります。

●セルを乗せてのリフローは行わないでください。

2.　逆電流防止回路

メモリーバックアップ用電源として使用する場合には、次のような回路を構成してください。

2.1.　2つのダイオードによる回路

ダイオードを図１のように接続してください。万が一に備えて、ダイオードは２つ使用してください。

2.2.　ダイオードと抵抗による回路

ダイオードと抵抗を図２の様に接続してください。

※使用する抵抗については、ダイオードが適切に機能しなかった場合を考慮し選定してください。

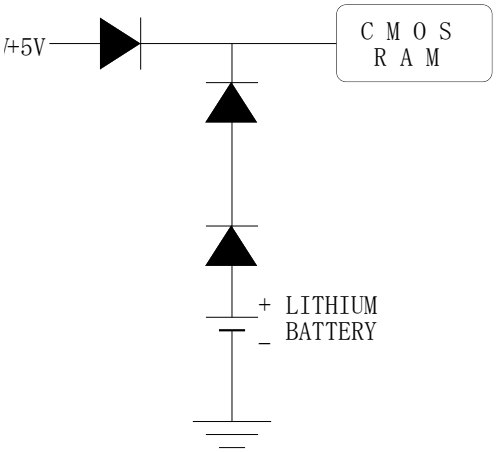


図１．ダイオードの接続例

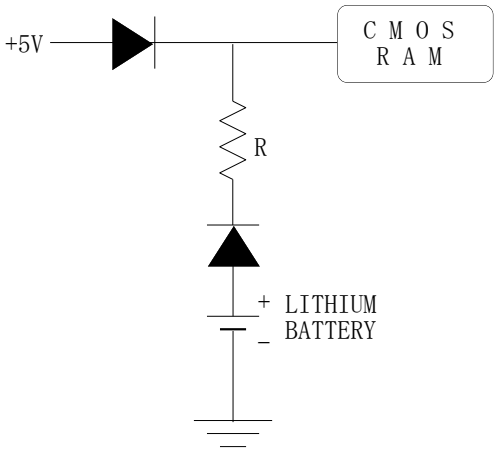


図２．ダイオードと抵抗の接続例

MSDS No.- T-36-05 (Revision–B)

MATERIAL SAFETY DATA SHEET

SECTION 1- CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

Manufacturer Name- Tadiran, US office address- 2001 Marcus Avenue, Suite 125E, Lake Success, NY 11040

Emergency Telephone No. – CHEMTREC: 1-800-424-9300
Tel. for information: 1-516-621-4980

Products Name: Primary (non-rechargeable) Lithium metal Thionyl Chloride ($Li/SOCl_2$) cells and batteries, Non-rechargeable. Cells include the models of TL, TLH, and TLL, 3.6V series. This MSDS covers the the above models: 2100, 2134, 2135, 2137, 2150, 2155, 2186, 2200, 2300, 2450, 4902, 4903, 4920, 4930, 4934, 4935, 4937, 4940, 4951, 4955, 4986, 5101, 5104, 5114, 5134, 5135, 5137, 5151, 5155, 5186, 5233, 5242, 5276, 5293, 5315, 5902, 5903, 5920, 5930, 5937, 5940 and 5955 with all their finishing versions and batteries assembled from them, denoted by "/" followed up by letters or digits.

SECTION 2- COMPOSITION, INFORMATION ON INGREDIENTS

Ingredient Name	CAS #	%	ACGIH (TLV)	OHSA (PEL)	CHIP Classification
Lithium Metal (Li)	7439-93-2	<5%	Not Established	None	**F:** R14/15 **C:** R34 **R:** 14/15, 34 **S:**(1/2), 8,43,45
Thionyl Chloride ($SOCl_2$)	7719-09-7	<47 %	**1** ppm (5 mg/M^3)	5 mg/m^3	**R:** 14,20/22,29, 35. **S:** (1/2),26,36/ 37/39, 45
Carbon (C)	1333-86-4	<6%	3.5 mg/m^3	3.5 mg/m^3	None known
Aluminum Chloride ($AlCl_3$)	7446-70-0	<5%	2 mg/m^3 (Al salt, soluble)		**R:** 34 **S:** (1/2),7/8,28, 45
Lithium Chloride (LiCl)	7447-41-8	<2%	Not Established		
Glass		<1%	Not Established		
PVC	9002-86-2	<1%	Not Established		
PTFE	9002-84-0	<1%	Not Established		

SECTION 3 - HAZARD IDENTIFICATION

The lithium Thionyl chloride batteries described in this MSDS are hermetically sealed units, which are not hazardous when used according to the recommendations of the manufacturer.

Under normal condition of use of the batteries, the electrode materials and the liquid electrolyte they contained are non-reactive provided the battery integrity is

maintained. Risk of exposure exists only in case of mechanical, electrical or thermal abuse. Thus the batteries should not short circuit, recharge, puncture, incinerate, crush, immerse in water, force discharge, or expose to temperatures above the temperature range of the cell or battery. In these cases there is risk of fire or explosion

SECTION 4- FIRST AID MEASURES

In case of battery rupture, explosion, or major leakage, evacuate personnel from contaminated area and provide good ventilation to clear out corrosive fumes, gases or the pungent odor. Seek immediate medical attention.

Eyes - First rinse with plenty of water for 15 minutes (remove contact lenses if easily possible), and then seek medical attention.

Skin - Remove contaminated clothes and rinse skin with plenty of water or shower for 15 min. Refer to medical attention.

Inhalation - Remove to fresh air, rest, and half-upright position, use artificial respiration if needed, and refer to medical attention.

Ingestion - rinse mouth, ***DO NOT*** induce vomiting, give plenty of water to drink, and refer to medical attention.

SECTION 5- FIRE FIGHTING MEASURES

FLASH POINT:	NA	LOWER (LEL):	NA
FLAMMABLE LIMIT IN AIR:	NA	UPPER (LEL):	NA

EXTINGUISHING MEDIA:

1. Lith- X (Class D extinguishing media) is the **only** effective on fires involving a few lithium batteries. If the cells are directly involved in a fire **DO NOT USE:** WATER, SAND, CO_2, HALON, and DRY POWDER OR SODA ASH EXTINGUISHERS.

2. If the fire is in adjacent area and the cells that are either packed in their original containers or unpacked, the fire can be fought based on fueling material, e.g., paper and plastic products. In these cases the use of copious amounts of **cold** water is effective extinguishing media. Storage area may also employ sprinkler system with cold water.

AUTO-IGNITION: NA

SPECIAL FIRE FIGHTING PROCEDURES: Wear self-contained breathing apparatus to avoid breathing of irritant fumes (NIOSH approved SCBA & full protective equipment). Wear protective clothing and equipment to prevent body contact with electrolyte solution.

Fire may be fought, but only from safe fire-fighting distance. Evacuate all persons from immediate area of fire.

UNUSUAL EXPLOSION AND FIRE EXPLOSION: Battery may explode when subject to: excessive heat (above 150ºC), recharged, over-discharged (discharge below 0V), punctured and crushed. During thermal decomposition generation of chlorine (Cl_2), hydrogen chloride (HCl), and sulfur dioxide (SO_2) can be formed.

SECTION 6- SPILL OR LEAKAGE PROCEDURES

PROCEDURES TO CONTAIN AND CLEAN UP LEAKS OR SPILLS: The material contained within the battery would only be released under abusive conditions.

In the event of battery rapture and leakage: contain the spill while wearing proper protective clothing and ventilate the area. Than, cover with sodium carbonate (Na_2CO_3) or 1:1 mixture of soda ash and slaked lime. Keep away from water, rain, and snow. Placed in approved container (after cooling if necessary) and disposed according to the local regulations.

NEUTRALIZING AGENTS: Sodium carbonate (Na_2CO_3) or 1:1 mixture of soda ash and slaked lime.

WASTE DISPOSAL METHOD: Product decomposed by water must be neutralized. if sufficiently diluted, it may be added to waste water if it is sufficiently diluted.

PRECAUTIONS IN HANDLING AND STORAGE: avoid short-circuiting, over-charging and heating to high temperatures. Store the batteries in dry and cool area and keep container dry and tightly closed in well-ventilated area. Store cells away from food and drink.

OTHER PRECAUTIONS; Never attempt to disassemble, machine, or otherwise modify batteries or injury may result.

SECTION 7- HANDLING AND STORAGE

The batteries should not be opened, destroyed or incinerate, since they may leak or rupture and release to the environment the ingredients that they normally contained in the hermetically sealed container.

HANDLING- Do not short circuit terminals, or expose to temperatures above the temperature rating of the battery, over charge the battery, forced over-discharge (voltage below 0.0V), throw to fire.

Do not crush or puncture the battery, or immerse in liquids.

STORAGE- is preferably done in cool (below 30ºC), dry and ventilated area, which is subject to little temperature change.

Do not place the battery near heating equipment, nor expose to direct sunlight for long periods. Elevated temperatures can result in shortened battery life and degrade performance.

Keep batteries in original packaging until use and do not jumble them.

Do not store batteries in high humidity environment for long periods.

OTHER- cells and batteries are not rechargeable batteries and should not be charged.

Applying pressure and deforming the battery may lead to disassembly followed by eye skin and throat irritation.

Follow manufacturer recommendations regarding maximum recommended current and operating temperature range.

SECTION 8 - EXPOSURE CONTROLS & PERSONAL PROTECTION

GENERAL- The following safety measures are not necessary in normal use. They need only be applied if there is a risk that, in use or handling, the recommendations, as outlined in Section 3, have not been followed.

RESPIRATORY PROTECTION: In case of abuse or leak of liquid or fumes, use NIOSH approved Acid Gas Filter Mask or Self-Contained Breathing Apparatus.

VENTILATION: In case of abuse, use adequate mechanical ventilation (local exhaust) for battery that vents gas or fumes.

PROTECTIVE GLOVES: In case of spill use PVC or Nitrile gloves of 15 mils (0.015 inch) or thicker.

EYE PROTECTION: Use ANSI approved chemical worker safety goggles or face shield.

OTHER PROTECTIVE EQUIPMENT: In case needed, chemical resistance clothing is recommended along with eye wash station and safety shower should be available meeting ANSI design criteria.

WORK HYGIENIC PRACTICES: Use good hygiene practice. Wash hands after use and before drinking, eating or smoking. Launder contaminated cloth before reuse.

SUPPLEMENTARY SAFETY AND HEALTH DATA: If the battery is broken or leaked the main hazard is the electrolyte. The electrolyte is mainly solution of Lithium chloride (LiCl), and aluminum chloride ($AlCl_3$) in Thionyl chloride ($SOCl_2$).

Fires may be fought but only from safe fire fighting distance, evacuate all persons from immediate area of fire.

Prevent heating of the battery, charging the battery, discharge to predetermined limit, do not crush, disassemble, incinerate or short circuit.

SECTION 9- PHYSICAL DATA

BOILING POINT (760 mm Hg)	NA, unless individual components exposed
VAPOR PRESSURE (mm Hg, 25ºC)	NA, unless individual components exposed
VAPOR DENSITY (air=1)	NA, unless individual components exposed
DENSITY (gr/cc)	> 1 gr/cc
VOLATILE BY VOLUME (%)	NA
EVAPORATION RATE (butyl acetate=1)	NA, unless individual components exposed
PHYSICAL STATE	Solid
SOLUBILITY IN WATER (% by weight)	NA, unless individual components exposed
PH	NA, unless individual components exposed
APPEARANCE	Geometric Solid Object
ODOR	If leaking, gives off pungent corrosive odor

SECTION 10- STABILITY AND REACTIVITY

STABLE OR NOT STABLE	Stable
INCOMPATIBILITY (MATERIAL TO AVOID)	Strong mineral acids, water and alkali solutions.
HAZARDOUS DECOMPOSITION PRODUCTS	1. Reaction of lithium with water: Hydrogen (H_2), Lithium hydroxide (LiOH). 2. Thermal decomposition over 150ºC: Sulfur oxides, (SO_2, SO_3), Sulfur chlorides (SCl_2, S_2Cl_2), Chlorine (Cl_2), Lithium oxide, Li_2O 3. Electrolyte with water: Hydrogen Chloride (HCl) and SO_2

DECOMPOSITION TEMPERATURE (ºF) NA

HAZARDOUS POLYMERIZATION: May Occur____ Will Not Occur __X__

CONDITIONS TO AVOID Avoid mechanical abuse and electrical abuse such as short-circuiting, overcharge, over-discharge, (voltage reversal) and heating.

SECTION 11- TOXICOLOGICAL INFORMATION

THRESHOLD LIMIT VALUE (TLV) AND SOURCE: NA

HEALTH HAZARD ACUTE AND CHRONIC: Inhalation, skin contact, eye contact and ingestion are not likely by exposure to sealed battery.

Inhalation, skin contact and eye contact are possible when the battery is opened. Exposure to internal contents, the corrosive fumes will be very irritating to skin, eyes and mucous membranes. Overexposure can cause symptoms of non-fibrotic lung injury and membrane irritation.
Carcinogenicity- NTP: No
Carcinogenicity- IARC: No
Carcinogenicity- OSHA: No

Explanation of Carcinogenicity- No ingredient of a concentration of 0.1% or greater is listed as a carcinogen or suspected carcinogen.

SIGNS AND SYMPTOMS OF OVEREXPOSURE: Exposure to leaking electrolyte from ruptured or leaking battery can cause:

Inhalation- Can cause burns and irritation of the respiratory system, coughing, wheezing and shortness of breath.

Eyes- Redness, tearing, burns. The electrolyte is corrosive to all ocular tissues.

Skin- The electrolyte is corrosive and causes skin irritation and burns.

Ingestion- The electrolyte solution causes tissue damage to throat and gastro/ respiratory track.

MEDICAL CONDITION AGGRAVATED BY EXPOSURE: Preexisting skin, asthma and respiratory diseases are generally aggravated by exposure to liquid electrolyte vapors or liquid. For further information refer to section 4.

SECTION 12- ECOLOGICAL INFORMATION

1. When properly used or disposed the battery does not present environmental hazard.
2. Cells do not contain mercury, cadmium, or lead.
3. Do not let internal components enter marine environment. Avoid release to waterways, wastewater or ground water.

SECTION 13- DISPOSAL CONSIDERATIONS

1. Dispose in accordance with the applicable regulations in country and state.
2. Disposal should be performed by permitted, professional disposal firms knowledgeable in Federal, State or Local requirements of hazardous waste treatment and hazardous waste transportation.
3. Incineration should never be performed by battery users, but eventually by trained professional in authorized facility with proper gas and fume treatment.
4. Battery recycling should be done in authorized facility.

SECTION 14- TRANSPORTATION /SHIPPING

Lithium metal cells and batteries are considered as Dangerous Goods, e.g., UN-3090 for cells and batteries and UN-3091 for cells or batteries in equipment or with equipment.

- The UN Recommendations on Transport of Dangerous Goods, Model Regulations
- The UN Recommendations on the Transport of Dangerous Goods, Manual of Tests and Criteria, "Lithium batteries" Part III, Section 38.3.

Worldwide besides the United State- Cells and Batteries must be packed accordance with Special Provisions of the applicable code, e.g., IATA, ICAO , IMO , ADR and the UN Model Regulations.

Within the US- the US DOT CFR 49 regulations, Parts 171, 172, 173 and 175 are governing the transportation of lithium cells and batteries. The requirements for the different transportation conditions (e.g., Air, Sea, with and within equipment and for disposal) are defined in part 173.185 "Lithium cells and batteries"

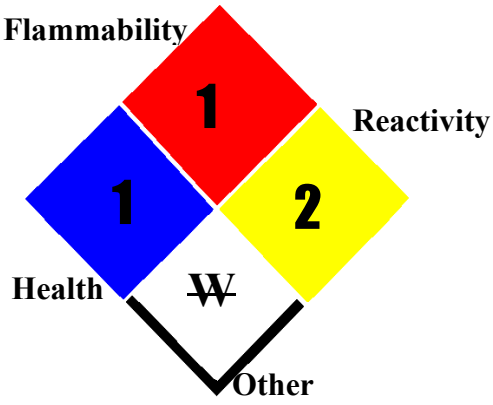
Identification and labeling in compliance with the product drawing should include the battery title, nominal voltage, lot number and warning.

SECTION 15- REGULATORY INFORMATION

1. All the cells and batteries are defined as "articles" and thus are exempt from the requirements of the Hazard Communication Standard".

2. The internal component (Thionyl chloride) is hazardous under the criteria of the Federal OHSA Hazard Communication Standard 29 CFR 1920.1200.

3. NFPA rating- Lithium batteries are not included in the NFPA material list. Below is the NFPA rating for lithium metal. Lithium metal is an internal component, enclosed by hermetically sealed metallic can. Under normal application is not exposed.



SECTION 16- OTHER INFORMATION/DISCLAIMER

The information and the recommendations set forth are made in good faith and believed to be accurate at the date of preparation. The present file refers to normal use of the product in question. Tadiran Batteries makes no warranty expressed or implied.

Assembly of battery packs:

The design and assembly of battery packs require special skills, expertise and experience. Therefore it is not recommended that the end user will attempt to self-

assemble battey packs. It is preferable that any battery using lithium cells will be assembled by TADIRAN to ensure proper battery design and construction. A full assembly service is available from TADIRAN who can be contact for further information. If for any reason, this is not possible, TADIRAN can review the pack design in confidential to ensure that the design is safe and capable of meeting the stated performance requirements.